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REMARKS

This application has been carefully reviewed in light of the Office Action dated October 18, 2006. Claims 2, 4, 12, 14, and 22 have been cancelled, without prejudice or disclaimer of the subject matter; and claims 1, 5 to 8, 11, 15 to 18, and 21 have been amended. Claims 1, 3, 5 to 11, 13, 15 to 21, 23, and 24 remain in the application, of which claims 1 and 11 are the independent claims. Reconsideration and further examination are respectfully requested.

Initially, it is noted that support for the substance of the amendments and the new claims is found throughout the disclosure, including at least page 10 to page 13 of the specification, and FIGS. 9 to 11. Accordingly, the Applicants respectfully assert that no new matter has been introduced.

As a preliminary matter, Applicants thank Examiner Bradley for the thoughtful courtesies and kind treatment afforded to Applicants' representative, Babak Akhlaghi, during the telephone interview conducted on January 9, 2007. During the interview, Examiner Bradley indicated that the Applicants' amendment appear to overcome the cited references. Examiner Bradley further indicated that, to the extent further amendments may be deemed necessary in order to overcome the cited references, Examiner Bradley would contact the Applicants and discuss any such amendments before issuing another Office Action. Accordingly, Applicants have decided not to interview this case at this time, and Applicants respectfully request entry of following remarks.

In the Office Action, claims 1 to 24 were rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 5,784,699 ("McMahon") and in view of U.S. Patent No. 7,007,149 ("Chung"). As indicated above, claims 2, 4, 12, 14, and 22 have been cancelled, without prejudice or disclaimer of the subject matter, and without conceding to the correctness of the rejections. Furthermore, independent claims 1 and 11 have been amended to obviate this rejection. Withdrawal of the rejection and further examination are therefore respectfully requested.

The present disclosure generally relates to the allocation of memory in a computer system, in which a size of a memory page used by a paged virtual memory system is determined. A request from an application is output to the page virtual memory system for allocation of a block of memory by an operating system to the application, the block of memory being integer N

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times the size of the memory page. The block of memory for the application is accessed and divided into (*N*-1) frames, with each of the frames operable to store an indexing structure associated with an attribute of a data record, and each frame being the same size as the memory page used by the operating system. A beginning page boundary of a first whole memory page within the block of memory is determined, and each of the frames is stored beginning at the beginning page boundary. Each of the frames is divided into a plurality of instances, with each of the plurality of instances operable to store an index node of the indexing structure, the index node including left and right pointers pointing to other index nodes of the index structure having the same attribute as the index node. Administrative data is stored in a cut-off portion of the block of memory disposed in front of the beginning page boundary or behind the (*N*-1)*th* frame, and the attribute is associated with the plurality of instances for data storage using the plurality of instances.

Referring to particular claim language, independent claim 1 recites a method for allocating memory in a computer system. The method includes determining a size of a memory page used by a paged virtual memory system, and outputting a request from an application to the page virtual memory system for allocation of a block of memory by an operating system to the application, the block of memory being integer *N* times the size of the memory page. The method also includes accessing the block of memory for the application and dividing the block of memory into (*N*-1) frames, with each of the frames operable to store an indexing structure associated with an attribute of a data record, and each frame being the same size as the memory page used by the operating system. The method also includes determining a beginning page boundary of a first whole memory page within the block of memory and storing the frames beginning at the beginning page boundary. The method further includes dividing each of the frames into a plurality of instances, with each of the plurality of instances operable to store an index node of the indexing structure, the index node including left and right pointers pointing to other index nodes of the index structure having the same attribute as the index node. The method also includes storing administrative data in a cut-off portion of the block of memory disposed in front of the beginning page boundary or behind the (*N*-1)*th* frame, and associating the attribute with the plurality of instances for data storage using the plurality of instances.

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Independent claim 11 recites a software application tangibly embodied on a computer-readable medium using application-level memory management which substantially corresponds to the method recited by independent claim 1.

The applied art is not seen to disclose, teach, or suggest the features of independent claims 1 and 11. In particular, neither McMahon nor Chung, either alone or in combination (assuming arguendo that such a combination were possible) are seen to disclose at least the features that $i)$ a size of a memory page used by a paged virtual memory system is determined, $ii)$ a request from an application is output to the page virtual memory system for allocation of a block of memory by an operating system to the application, the block of memory being integer N times the size of the memory page, $iii)$ the block of memory for the application is accessed and divided into $(N-1)$ frames, with each of the frames operable to store an indexing structure associated with an attribute of a data record, and each frame being the same size as the memory page used by the operating system, $iv)$ a beginning page boundary of a first whole memory page within the block of memory is determined, and each of the frames is stored beginning at the beginning page boundary, $v)$ each of the frames is divided into a plurality of instances, with each of the plurality of instances operable to store an index node of the indexing structure, the index node including left and right pointers pointing to other index nodes of the index structure having the same attribute as the index node, $vi)$ administrative data is stored in a cut-off portion of the block of memory disposed in front of the beginning page boundary or behind the $(N-1)th$ frame, and $vii)$ the attribute is associated with the plurality of instances for data storage using the plurality of instances.

McMahon describes a memory allocator that employs a data structure to maintain an inventory of dynamically allocated memory available to receive new data. *See* McMahon, col. 4, ln. 58 to col. 5, ln. 8; and Abstract. In particular, the memory allocator is seen to assign portions of memory into multiple slots of different sizes, with each slot including one or more memory blocks of equal size. *See* McMahon, Abstract. Thereafter, the memory allocator is understood to receive, from a software program, a request for a particular size of memory block, rounds the requested size of memory block to the nearest slot size, and uses a free list corresponding to the nearest slot size to search for an available memory block. *See* McMahon, col. 3, ll. 28 to 30. If the memory allocator finds such a memory block, then the memory block is seen to be assigned

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to the software program. *See* McMahon, col. 5, ll. 32 to 35. Otherwise, the memory allocator is understood to search for an available memory block from a free list corresponding to the next largest slot size. *See* McMahon, col. 3, ll. 30 to 35. The memory allocator is seen to continue these operations until it finds an available memory block to satisfy the request.

Accordingly, McMahon is not seen to describe, nor does the Office Action even assert that McMahon describes, at least the features that *i)* a size of a memory page used by a paged virtual memory system is determined, *ii)* a request from an application is output to the page virtual memory system for allocation of a block of memory by an operating system to the application, the block of memory being integer N times the size of the memory page, *iii)* the block of memory for the application is accessed and divided into (N-1) frames, with each of the frames operable to store an indexing structure associated with an attribute of a data record, and each frame being the same size as the memory page used by the operating system, *iv)* a beginning page boundary of a first whole memory page within the block of memory is determined, and each of the frames is stored beginning at the beginning page boundary, *v)* each of the frames is divided into a plurality of instances, with each of the plurality of instances operable to store an index node of the indexing structure, the index node including left and right pointers pointing to other index nodes of the index structure having the same attribute as the index node, *vi)* administrative data is stored in a cut-off portion of the block of memory disposed in front of the beginning page boundary or behind the (N-1)*th* frame, and *vii)* the attribute is associated with the plurality of instances for data storage using the plurality of instances.

Chung fails to remedy the deficiencies of McMahon. Chung describes to a method for using a limited memory area of a mobile communication terminal. *See* Chung, Abstract. As shown in FIG. 3 of Chung, the entire memory is seen to be classified into individual groups (e.g., a name group, a company group, and a home phone group, etc.). *See* Chung, col. 3, ll. 17-23. Each group includes plurality of fields, with each field including an index, which helps the user to access the data. *See* Chung, col. 3, ll. 23-26. For instance, in the name group of FIG. 3, a first designated name having index No. 1 is saved in the first field of the name group and a second designated name having index No. 2 is saved in the second filed in the name group. According to Chung, if any individual field is not occupied (e.g., the given index number has not data for the field), instead of leaving that field empty, the field is believed to be filled with data

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corresponding to the next index. *See* Chung, col. 3, ll. 35-45 ("if there is not data for a company corresponding to a name in a second field associated with index No. 2, the field in the company group becomes available for use for the next company name instead of remaining unused.")

Accordingly, Chung also is not seen to describe, nor does the Office Action even assert that Chung describes, at least the features that *i)* a size of a memory page used by a paged virtual memory system is determined, *ii)* a request from an application is output to the page virtual memory system for allocation of a block of memory by an operating system to the application, the block of memory being integer *N* times the size of the memory page, *iii)* the block of memory for the application is accessed and divided into (*N*-1) frames, with each of the frames operable to store an indexing structure associated with an attribute of a data record, and each frame being the same size as the memory page used by the operating system, *iv)* a beginning page boundary of a first whole memory page within the block of memory is determined, and each of the frames is stored beginning at the beginning page boundary, *v)* each of the frames is divided into a plurality of instances, with each of the plurality of instances operable to store an index node of the indexing structure, the index node including left and right pointers pointing to other index nodes of the index structure having the same attribute as the index node, *vi)* administrative data is stored in a cut-off portion of the block of memory disposed in front of the beginning page boundary or behind the (*N*-1)*th* frame, and *vii)* the attribute is associated with the plurality of instances for data storage using the plurality of instances.

Accordingly, based on the foregoing amendments and remarks, independent claims 1 and 11 are believed to be allowable over the applied references. The remaining rejected claims in the application are each dependent on these independent claims and are believed to be allowable for at least the same reasons. Because each dependent claim is deemed to define an additional aspect of the invention, individual consideration of each on its own merits is respectfully requested.

No other matters being raised, it is believed that the entire application is fully in condition for allowance and such action is courteously solicited.
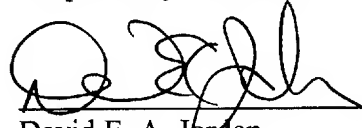
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No fees are believed to be due at this time. Please apply any other charges or credits to Deposit Account 06 1050.

Respectfully submitted,

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